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124. **Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, O.**

Find the average area of a spherical polygon of $n=6$ sides.

MISCELLANEOUS.

124. **Proposed by J. W. YOUNG, Graduate Student, Cornell University, Ithaca, N. Y.**

Prove that the general value of θ, which satisfies the equation

$$(\cos\theta+i\sin\theta)(\cos2\theta+i\sin2\theta)\ldots\text{to } n \text{ factors}=1 \text{ is } \frac{4m\pi}{n(n+1)};$$

where m is any integer $(i=\sqrt{-1})$.

125. **Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, O.**

Assume $m=nt+\varepsilon-\omega$, thus giving $v=m+e\sin v$ as the relation connecting the mean and eccentric anomalies, then express $x=a\cos v$, $y=b\sin v$, and $r=a(1-e\cos v)$ by a Fourier series in terms of m.

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BOOKS AND PERIODICALS.

Graphs. By Robert J. Aley, A. M., Ph. D., Professor of Mathematics in the Indiana University. Pamphlet Form, 21 pages. Price, 10 cents. Boston and Chicago: D. C. Heath & Co.

This is No. 6 of Heath's Mathematical Monographs issued under the general editorship of Webster Wells, S. B., Professor of Mathematics in the Massachusetts Institute of Technology. In this monograph, Dr. Aley has pointed out the various uses that are being made of Graphs in almost every department of knowledge. In addition to plotting a temperature curve, four problems are solved by means of graphs, of which the first is the following: "A travels 4 miles an hour, B 6 miles an hour. If A has two hours the start, when and where will B overtake him?" Then comes the solution of Linear Equations in two variables, and following these, Simultaneous Quadratics, closing with the graphic representation of complex numbers.

College Algebra. By Leonard Eugene Dickson, Ph. D., Assistant Professor of Mathematics in the University of Chicago. First edition. First thousand. 8 vo. Cloth, vi+214 pages. Price, $1.50. New York: John Wiley & Sons.

"This text," the author tells us, "is intended primarily for college and technical schools. By treating only the subjects usually given in the college course in algebra, space has been gained for more detailed exposition of the more difficult topics." The work begins with a treatment of Number in Algebra; Surds and Imaginaries. Then follows in order the subjects Exponents—Logarithms; FactorTheorem—QuadraticEquations; Simultaneous Equations—Determinants; Ratio—Proportion, Variation, the Progressions, Compound Interest and Annuities; Undetermined Coefficients, Partial Fractions; Permutation and Combination, Binomial and Multinomial Theorem; Probability, Mathematical Induction, Limits, Indeterminate Forms; Convergency and Divergency of Series; Power Series and other series, Summation of Series, the Method of Differences, Graphic Algebra, Theory of Equations and an Appendix. Every subject treated by Dr. Dickson is treated in a thoroughly scientific manner, and with that accuracy and rigor so characteristic of all of his mathematical work. Dr. Dickson deserves the highest praise for sacrificing his time so fully devoted to original investigations in the various branches of mathematics and giving it to the preparation of text-books to be used in colleges. We hope that this edition will soon be exhausted, and that in the second edition he will add considerable material on the still more elementary parts of algebra, thus adapting the work to a larger constituency.

The Public School Arithmetic. For Grammar Grades, based on McLellan and Dewey's "Psychology of Numbers." By J. A. McLellan, A. M., LL. D., and A. F. Ames, A. B. 16 mo. Cloth. xii+369 pages. Price, 60 cents. New York: The Macmillan Co.

This book is based on Dewey & McLellan's "Psychology of Numbers," the basal idea of which is the correlation of number and measurement. They hold, *no number without measurement, no measurement without number*. This idea of number has been, I think, very successfully refuted a number of times by a number of different mathematicians and educators. Certainly the idea of number existed a long time before the idea of measurement. If one were to count the number of stone in a stone fence, the unit of measure in this case is one certainly very hard to adjust to our modern notion of a unit of measure. It would seem that a book, based upon what seems to a great number, perhaps the greater number, of our best educators to be erroneous, would have very little to commend it. But this is not true in regard to the book under consideration. The problems for solution are thoroughly practical, being taken from every source of modern life, commercial, agricultural, industrial and social. These problems are presented in such a way that the pupil can easily realize the conditions which gave rise to them. The systematic arrangement of the solutions of illustrative problems is another feature of the work which is highly commendable. These solutions are given in steps, though steps are not numbered. The subject of mensuration which, because of pressure from outside, has been omitted entirely by a number of authors, has received attention in this book commensurate with its importance. There are a number of other features that are commendable, for the appreciation of which the book should be consulted.

The American Journal of Mathematics. Edited by Frank Morley with the cooperation of Simon Newcomb and other mathematicians. Published under the auspices of the Johns Hopkins University. Price, $5.00 per year in advance. No. 1, Vol. xxiv, contains to following articles:

Cyclic Group of the Simple Ternary Linear Fractional Group in a Galois Field, by L. E. Dickson; Curves of Triple Curvature, by James G. Hardy; Primary Prime Functions in Several Variables and a Generalization of an Important Theorem of Dedekind, by Harris Hancock; On Certain Properties of the Plane Cubic Curve in Relation to Circular Points at Infinity, by R. A. Roberts; Estimates of Pierce's Linear Associative Algebra, by H. E. Hawkes; Groups Defined by the Orders of Two Generators and the Order of Their Product, by G. A. Miller.

Annals of Mathematics. Edited by Ormond Stone, W. E. Byerly, W. F. Osgood and others. Published quarterly under the auspices of Harvard University. Price, $2.00 per year. No. 2, Vol. 3, second series, January, 1902, contains the following articles:

Some Applications of the Method of Abridged Notation, by Professor Maxime Bocher; On Roots of Functions Connected by a Linear Recurrent Relation of the Second Order, by Dr. M. B. Porter; Space of Constant Curvature, by Professor F. S. Woods.

Cyclographic Transformation of Ordinary Space. By Dr. Arnold Emch. Reprint from the University of Colorado Studies.

The following periodicals have been received: *The Open Court*, for February; *Educational Times*, for February; *Kansas University Quarterly; Bulletin of the American Mathematical Society; Scientific American;* and *The American Monthly Review of Reviews.*